

CLAIMS

What is claimed is:

1. A system for controlling and monitoring communication devices used in multi-way communications, the system comprising:
 - a first communication device operable for communicating with a second communication device;
 - a controller unit in communication with said first communication device, wherein said controller unit is adapted to provide control data to said first communication device;
 - 10 a monitoring unit in communication with said first communication device, wherein said monitoring unit is adapted to provide inquiry data to said first communication device and is adapted to receive status data from said first communication device;
 - 15 an entity replica storage unit in communication with said monitoring unit, wherein said entity replica storage unit is adapted to receive said status data from said monitoring unit, store said status data as replica data, and provide said replica data to said monitoring unit; and
 - 20 a user interface in communication with said controller unit and said monitoring unit, wherein said user interface is adapted to provide user data to said controller unit and said monitoring unit and is adapted to receive said replica data from said monitoring unit.
2. The system of claim 1 wherein said controller unit is further adapted to receive response data from said first communication device and provide said response data to said user interface.
3. The system of claim 1 wherein said first communication device is adapted to provide and receive session initiation protocol (SIP) data from said controller unit and said monitoring unit.
- 25 4. The system of claim 3 wherein said first communication device comprises a SIP phone.
5. The system of claim 3 wherein said first communication device comprises a time division multiplexing (TDM) phone.
- 30 6. The system of claim 5, the system further comprising:

a front end SIP unit in communication with said first communication device, said controller unit, and said monitoring unit,

wherein said front end SIP unit is adapted to convert a first SIP data into a first computer-telephony-integration (CTI) data and convert a second CTI data into a second SIP data,

5 wherein said front end SIP unit is further adapted to receive said first SIP data from said controller unit and said monitoring unit, provide said first CTI data to said first communication device, receive said second CTI data from said first communication device, and provide said second SIP data to said controller unit and said monitoring unit.

10 7. The system of claim 3 wherein said first communication device is a SIP enabled PBX phone.

8. A method of controlling and monitoring communication devices used in multi-way communications, the method comprising the steps of:

15 modeling a communication device as a logical representation and a physical representation, wherein said logical representation represents said communication device's communication link and wherein said physical representation represents said communication device's physical attributes;

20 associating said logical representation with a first unique identifier and associating said physical representation with a second unique identifier;

 identifying a plurality of logical representations and a plurality of physical representations within a network of communication devices;

 determining a plurality of relationships between said plurality of logical representations and said plurality of physical representations;

25 establishing a device control channel for each of a set of said plurality of physical representations;

 establishing a call control channel for each of a set of said plurality of logical representations;

30 controlling said set of said plurality of logical representations and said plurality of physical representations via said call control channel and said device control channel;

monitoring said set of said plurality of logical representations and said plurality of physical representations; and

storing a replica of data monitored from said set of said plurality of logical representations and said plurality of physical representations.

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9. The method of claim 8, wherein the step of associating said logical representation with a first identifier and associating said physical representation with a second identifier comprises the steps of:

10 associating said logical representation with a phone number, if said communication device is a TDM device;

associating said logical representation with an email address, if said communication device is a SIP device;

associating said physical representation with a phone number, if said communication device is a TDM device with only one communication line; and

15 associating said physical representation with a fully qualified domain name (FQDN), if said communication device is a SIP device.

10. The method of claim 9, further comprising the step of using said device control channel to connect to said physical representation, if said communication device is a TDM device with
20 more than one communication line.

11. The method of claim 8, wherein determining a plurality of logical representations and a plurality of physical representations comprises searching a network directory for a listing of communication devices within a network.

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12. The method of claim 8, wherein establishing a device control channel comprises:

sending a SIP INVITE message to a second communication device from said first communication device;

receiving a SIP OK response by said first communication device from said second
30 communication device;

sending a SIP acknowledgement (ACK) message from said first communication device to said second communication device in response to receiving said SIP OK response; and
sending a SIP SUBSCRIBE message to said second communication device from said first communication device.

5 receiving a SIP OK response by said first communication device from said second communication device; and

sending a SIP NOTIFY message to said second communication device from said first communication device.

10 13. The method of claim 8, wherein establishing a call control channel comprises:

sending a SIP OPTIONS message to said second communication device from said first communication device;

receiving a SIP OK response by said first communication device from said second communication device;

15 sending a SIP SUBSCRIBE message to said second communication device from said first communication device.

receiving a SIP OK response by said first communication device from said second communication device; and

20 sending a SIP NOTIFY message to said second communication device from said first communication device.

14. A computer-readable medium having computer-executable instructions for controlling and monitoring communication devices used in multi-way communications, the computer-executable instructions performing steps comprising:

25 modeling a communication device as a logical representation and a physical representation, wherein said logical representation represents said communication device's communication link and wherein said physical representation represents said communication device's physical attributes;

associating said logical representation with a first unique identifier and

30 associating said physical representation with a second unique identifier;

- identifying a plurality of logical representations and a plurality of physical representations within a network of communication devices;
- determining a plurality of relationships between said plurality of logical representations and said plurality of physical representations;
- 5 establishing a device control channel for each of a set of said plurality of physical representations;
- establishing a call control channel for each of a set of said plurality of logical representations;
- controlling said set of said plurality of logical representations and said plurality of
- 10 physical representations via said call control channel and said device control channel;
- monitoring said set of said plurality of logical representations and said plurality of physical representations; and
- storing a replica of data monitored from said set of said plurality of logical representations and said plurality of physical representations.
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15. The computer-readable medium of claim 14, wherein the step of associating said logical representation with a first identifier and associating said physical representation with a second identifier comprises the steps of:
- associating said logical representation with a phone number, if said
- 20 communication device is a TDM device;
- associating said logical representation with an email address, if said communication device is a SIP device;
- associating said physical representation with a phone number, if said communication device is a TDM device with only one communication line; and
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- associating said physical representation with a fully qualified domain name (FQDN), if said communication device is a SIP device.
16. The computer-readable medium of claim 15 having further computer-executable instructions for using said device control channel to connect to said physical representation, if
- 30 said communication device is a TDM device with more than one communication line.

17. The computer-readable medium of claim 14, wherein determining a plurality of logical representations and a plurality of physical representations comprises searching a network directory for a listing of communication devices within a network.
- 5 18. The computer-readable medium of claim 14, wherein establishing a device control channel comprises:
- sending a SIP INVITE message to a second communication device from said first communication device;
- receiving a SIP OK response by said first communication device from said second communication device;
- sending a SIP ACK message from said first communication device to said second communication device in response to receiving said SIP OK response; and
- sending a SIP SUBSCRIBE message to said second communication device from said first communication device.
- 15 receiving a SIP OK response by said first communication device from said second communication device; and
- sending a SIP NOTIFY message to said second communication device from said first communication device.
- 20 19. The computer-readable medium of claim 14, wherein establishing a call control channel comprises:
- sending a SIP OPTIONS message to said second communication device from said first communication device;
- receiving a SIP OK response by said first communication device from said second communication device;
- sending a SIP SUBSCRIBE message to said second communication device from said first communication device.
- receiving a SIP OK response by said first communication device from said second communication device; and
- 25 sending a SIP NOTIFY message to said second communication device from said first communication device.
- 30 sending a SIP NOTIFY message to said second communication device from said first communication device.